

REMARKS

The present application includes pending claims 1-8. Claims 1-7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,054,061 ("Bayes") in view of United States Patent No. 6,106,899 ("Nakagawa") and U.S. Patent No. 5,447,619 ("Wolski"). Claim 8 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Bayes in view of Nakagawa and Wolski, and further in view of United States Patent No. 5,962,190 ("McKeever"). Claims 1-7 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 and 5 of co-pending Application No. 10/028,955 in view of Nakagawa and Wolski.

By this Amendment, new claims 9-12 have been added. Support for the new claims appears in the Application in paragraphs 3 and 57. Applicants respectfully submit that pending claims 1-12 are patentable for the reasons provided below.

Nakagawa Does Not Supply The Coating Promoter Claimed By Applicants

The Office Action dated December 28, 2005 appears to repeat the text of the prior art rejections made in the Office Action dated June 1, 2005, with the exception of the following text:

1. Applicant's arguments filed 10/5/05 have been fully considered but they are not persuasive. Applicant's argue that Nakagawa's benzotriazole is a five membered aromatic fused N-heterocyclic but not a coating promoter and also does not suggest to use the compound as a coating promoter.
2. In response, examiner states that the argument is not persuasive because may be Nakagawa does not called benzotriazole is a coating promoter but teaches use of such compound for increasing/promoting

adhesion between copper surface and resin in the manufacturing of printed circuit board. . . .

Additionally, such provision would have been encouraged by Nakagawa's teaching that such compound promotes the very type of adhesion to copper desired by Bayes.

Applicants respectfully traverse. Nakagawa simply does not disclose any compounds that meet the "coating promoter" limitation of Applicants' claims. Applicants' coating promoter is described in paragraphs 40-41 of the Application. The coating promoter is described as a five membered aromatic fused N-heterocyclic ring compound with 1 to 3 nitrogen atoms in the fused ring, wherein none of the 1 to 3 nitrogen atoms in the fused ring are bonded to a hydrogen atom. (Application, paragraph 40; *see also* dependent claims 6-8.) Referring to Figure 4, the Application lists suitable substituents for the fused ring compound. (Paragraph 41.) Additionally, the Application lists examples of suitable coating promoter compounds, all of which are five membered aromatic fused N-heterocyclic ring compounds. (Paragraph 40.)

Nakagawa does not name a single compound that falls within any of these categories. The fact that Nakagawa may describe the use of other compounds for "increasing/promoting adhesion" is irrelevant, because those other compounds are not coating promoters as described by Applicants. Because Nakagawa fails to disclose, teach or suggest Applicants' coating promoter, Nakagawa cannot "teach the use of such compound for increasing/promoting adhesion between copper surface and resin."

The closest that Nakagawa comes to one of Applicants' coating promoters is "benzotriazole," which is used in the comparative examples of Nakagawa. But unsubstituted benzotriazole is specifically excluded from the categories of coating

promoters taught by Applicants in the present Application (see discussion above and paragraphs 40 and 41 in the Application).

Even if benzotriazole was a coating promoter as taught by Applicants, Nakagawa ***teaches away from its use***. Comparative examples 3 and 7 of Nakagawa employ benzotriazole. These comparative examples are described as unsuccessful in Nakagawa. See Tables 1 and 2 in Nakagawa, which rate comparative examples 3 and 7 as “XX” for the inter-layer peel test. The designation “XX” denotes “very much lifting,” i.e. poor adhesion. See col. 5 lines 1-3. In other words, when Nakagawa used benzotriazole, the adhesion test failed. Thus, even assuming that benzotriazole is a coating promoter as taught by Applicants (which it definitely is not), Nakagawa teaches away from its use.

In view of the above (and also considering that Nakagawa is directed to a completely different aspect of circuit board manufacture than is Bayes, as explained in Applicants’ October 3, 2005 Amendment), Nakagawa cannot be properly combined with Bayes, Wolski and McKeever to reject Applicants’ claims. Specifically, a *prima facie* case of obviousness has not been established because (1) when combined with the other cited references, Nakagawa does not “teach or suggest all the claim limitations” (the coating promoter) and (2) even if Nakagawa did teach or suggest Applicants’ coating promoter, it teaches away from using such compound rather than providing a suggestion or motivation “to combine reference teachings.” See MPEP 706.02(j). Applicants therefore respectfully request that the rejection of pending claims 1-8 in view of Bayes, Nakagawa, Wolski and McKeever be withdrawn.

***Other Reasons Supporting The Nonobviousness
Of The Present Claims Over The Cited References***

Applicants also traverse the 35 U.S.C. 103 rejections made in the Office Action for the other reasons expressed in Applicants' October 3, 2005 Amendment and Response.

For instance, Application claims 1 and 2 are distinct from Bayes (as described in the Office Action) in that they include the step of cleaning a copper surface with a highly built alkaline cleaning solution. The Wolski reference is cited to supply this missing step. In particular, Wolski is described as teaching "that copper surface is cleaned by soaking alkaline cleaning solution for removing stainproof layer from the copper surface in order to have a cleaner surface." Applicants submit that Wolski does not teach the use of a highly built alkaline cleaning solution to clean a copper surface. The text of Wolski that is cited in the Office Action merely states that "removal of the stainproof layer . . . is accomplished by either chemical (alkaline soaking followed by acid soaking) cleaning, or mechanical cleaning" (Col. 10 lines 7-9.) The Office Action provides no evidence that "alkaline soaking followed by acid soaking" is the same as applying a "highly built alkaline cleaning solution." Indeed, the present specification describes a highly built alkaline cleaning solution as comprising a surfactant and a phosphate or a phosphate ester. (Application, paragraph 46.) Wolski makes no mention of the use of surfactants or phosphates. Because the Office Action fails to explain how the basic/acidic soaking steps described in Wolski renders obvious to one of ordinary skill in the art the Applicants' claimed use of a "highly built alkaline cleaning solution," Applicants request that this rejection be withdrawn.

Applicants also submit that Bayes cannot be properly combined with McKeever to render pending claim 8 obvious under 35 U.S.C. 103 because the references are directed to two completely different aspects of multilayer PCB manufacture. Bayes is directed to a composition that is applied to a metal surface by way of a bath or a spray, which operates to “increase its surface roughness for subsequent adhesion to a polymer layer.” (Bayes, Abstract and Col. 6, lines 28-31). McKeever, on the other hand, is directed to polymerizable compositions which are used

to form a photoresist (or resist) layer on a substrate, such as copper clad glass epoxy, to allow subsequent selective processing of the substrate [or] to form a permanent solder mask layer on an imaged substrate to protect the underlying circuit lines from solder exposure

(Col. 1, lines 14-21.) In other words, Bayes teaches a composition which ***modifies a metal surface to improve adhesion***, whereas McKeever is directed to polymeric film compositions which are applied to a metal surface to function as a photoresist and to protect the surface or portions of the surface. There is no teaching in McKeever to suggest that the polymeric compositions ***modify*** a metal surface to improve adhesion.

Furthermore, because the compositions of McKeever are used to ***protect*** the substrate rather than to modify it, the reference actually teaches away from combination with the surface modification composition of Bayes. In other words, McKeever suggests that the components of its polymeric coating compositions – which tend to be protective and do not modify the surface of the substrate – would ***not*** be a useful addition to the surface roughening bath of Bayes, which does purposefully modify the metal surface. For the foregoing reasons, applicants submit that Bayes is not properly combinable with McKeever. Applicants thus respectfully request that the rejection of claim 8 as obvious over Bayes in view of Nakagawa, Wolski and McKeever be withdrawn.

Obviousness-Type Double Patenting Rejection

Claims 1-7 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 and 5 of co-pending Application No. 10/028,955 in view of Nakagawa and Wolski. Claims 1-2 and 5 of the co-pending application are described as differing from the instant Application in that they do not employ an adhesion promoting composition that includes a coating promoter and also in that they do not contain a step for applying a highly built alkaline cleaning solution.

Nakagawa and Wolski are cited to supply the missing coating promoter and cleaning solution, respectively. As Applicants have explained above, however, Nakagawa does not disclose any of the presently claimed coating promoters. In addition, Wolski does not disclose the presently claimed cleaning solution. For these same reasons, Applicants submit that Nakagawa and Wolski cannot be combined with the claims of the '955 application to arrive at Applicants' presently claimed subject matter. Thus, Applicants respectfully request withdrawal of the provisional rejection under the doctrine of obviousness-type double patenting.

New Claims 9-12

New claims 9-12 contain novel subject matter that is distinguishable from the cited references for many of the same reasons given above. Claims 9-12 are also distinguishable from the cited references for additional reasons. For example, in claims 9-12, the surface of an imaged layer of copper is roughened by contact with a surface roughening composition. In contrast, there is no teaching or suggestion in Nakagawa

that the disclosed solutions (or their components) will roughen a copper surface. Furthermore, neither Bayes nor Nakagawa teach the use of a tank having stainless steel surfaces or the use of a copper salt to protect such surfaces from chemical attack (see new claims 11-12). Applicants respectfully submit that new claims 9-12 contain allowable subject matter.

CONCLUSION

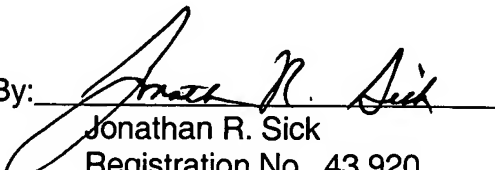
Applicants have shown that this application satisfies all the legal requirements pointed out by the Examiner. Therefore, the Examiner is respectfully requested to prepare a Notice of Allowability allowing all the pending claims 1-12.

If the Examiner has any questions or the Applicants can be of any assistance, the Examiner is invited and encouraged to contact the undersigned at the number listed below. The Commissioner is authorized to charge any necessary fees or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

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